INOmax® DS_{IR} Troubleshooting

Warning: Use caution when troubleshooting the INOmax DS_{IR} while in use for a patient. When possible replace the unit in question, and perform troubleshooting procedure once the unit is removed from the patient.

If the system fails to operate properly:

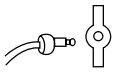
1. Check the patient condition and take appropriate action.
2. Verify that the system is set up as detailed in Section 2/ Setup of the Operation and Maintenance Manual.
3. Use the INOblender® (see INOblender Operation Manual) or backup mode if necessary (see page 29 of manual).
4. Find a symptom or alarm condition in the troubleshooting table which best describes the problem and follow the recommended actions to resolve the problem.

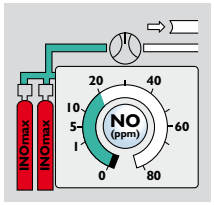
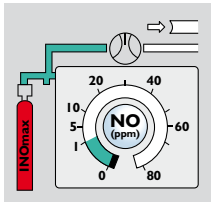
If the problem can't be corrected:

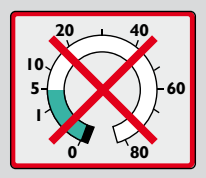
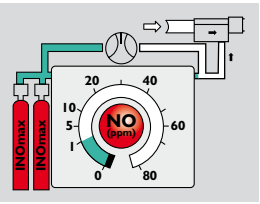
Contact Customer Service on 1300 198 565.

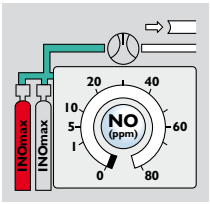
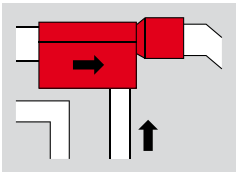
Troubleshooting Guide

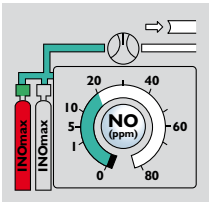
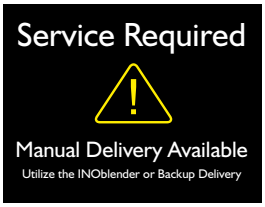
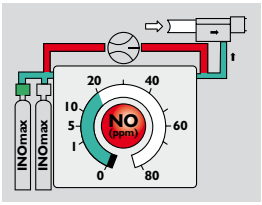
High Priority Alarms		
Symptom/Alarm	**Possible Cause**	**Recommended Action**
1. High NO Alarm  **High NO**	A. Note: A newly installed NO sensor will give high readings until fully conditioned (about 5 hours) and calibrated.	a. After installation of the NO sensor perform a low and high calibration. b. Wait 5 hours and repeat both the low and high calibration.
	B. The High NO alarm level may be inappropriately set.	a. Make sure the High NO alarm is set greater than the Set NO value.
	C. The NO calibration may have drifted.	a. Perform a low and high range calibration of the NO sensor. b. Check calibration sample tee for leaks.
	D. Circuit setup incorrect.	a. Check circuit setup for correct use of adapters and/or check valves.

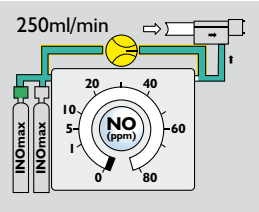
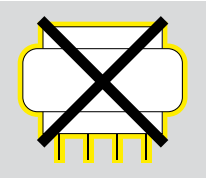
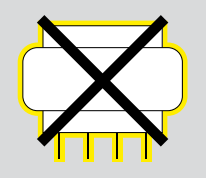
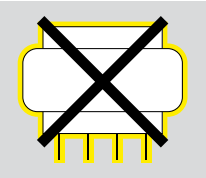
High Priority Alarms		
Symptom/Alarm	**Possible Cause**	**Recommended Action**
2. Low NO Alarm  **Low NO**	A. The Patient Gas Sample line may be disconnected.	a. Reconnect the Patient Gas Sample line.
	B. The Low NO alarm setting may be inappropriately set.	a. Make sure the Low NO alarm is set less than the Set NO value.
	C. The NO calibration may have drifted.	a. Perform a low and high range calibration of the NO sensor.
	D. The NO sensor may not be properly seated.	a. Make sure the sensors are correctly seated with the O-rings and the sensor cover is fully closed.
	E. Loss of NO delivery.	a. If the INOblender® is available, manually ventilate the patient (see INOblender Operation Manual). or b. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual).
3. High NO_2 Alarm  **High NO_2**	A. Incomplete system purge.	a. Perform a system purge. See Section 3/ Pre-Use Checkout. 
	B. Ventilator flow stopped.	a. Allow the ventilator gas to flush NO and NO_2 from the breathing circuit before connecting to the patient.
	C. Two cylinder valves are open.	a. Close one of the cylinder valves.
	D. The NO_2 alarm limit may be set too low.	a. Make sure the NO_2 alarm limit is appropriate for the Set NO level.
	E. The NO_2 calibration may have drifted.	a. Perform a low and high range calibration of the NO_2 sensor. b. Check calibration sample tee for leaks.
	F. Out of date or the wrong calibration gas was used.	a. Verify the calibration gas expiration date. b. If needed replace the calibration gas and perform a low and high range calibration of the NO_2 sensor.
	G. The patient circuit setup may be incorrect.	a. Make sure the patient circuit hoses and lengths are correct (see Section 4/ Patient Application of Operation and Maintenance Manual). b. Verify the humidifier chamber is less than 480 mL.
	H. Sample line occlusion. In this case, this alarm may occur with a Sample Line Block alarm.	a. Confirm whether the High NO_2 alarm occurs concurrently with a sample line block alarm. b. If so, this alarm will clear within 10 seconds after the sample line fault is remedied.
	I. The INOmax® DS_{IR} may have failed.	a. Contact Customer Service. b. Replace the delivery system if in use. c. Do not use the delivery system until serviced.

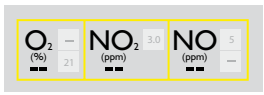
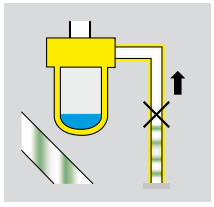
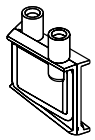
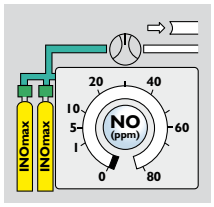
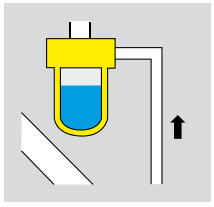
High Priority Alarms		
Symptom/Alarm	**Possible Cause**	**Recommended Action**
4. High O_2 Alarm  	A. The O_2 alarm setting may be inappropriate.	a. Make sure the High O_2 alarm is set appropriately for the O_2 setting being used on the ventilator.
	B. The O_2 calibration may have drifted.	a. Perform a low and high range calibration of the O_2 sensor. b. Change the O_2 sensor if the monitor fails to calibrate. c. Contact Customer Service. d. Replace the delivery system if in use. e. Do not use the delivery system until service.
5. Low O_2 Alarm  	A. The O_2 concentration setting at the ventilator was reduced.	a. Make sure the O_2 alarm setting is correct for the setting at the ventilator.
	B. The O_2 alarm setting may be inappropriate.	a. The INOmax DS_{IR} can dilute the O_2 concentration set at the ventilator by up to 10%. b. Verify that the alarm is set appropriately for the O_2 setting being used on the ventilator.
	C. The O_2 sensor may not be properly seated.	a. Make sure the sensors are correctly seated and the sensor cover is fully closed.
	D. The O_2 calibration may have drifted.	a. Perform a low and high range calibration of the O_2 sensor. b. Contact Customer Service.
6. Cylinder Not Detected  or Cylinder Valve Closed  	A. Interference with the Infrared communication link between the INOMAX cylinder and the INOmax DS_{IR}. (Delivery Stopped will occur one hour from the point when communication is lost).	a. Remove obstruction between the INOMAX cylinder and the INOmax DS_{IR}. b. Move the interfering light or the cart to reduce the high intensity light in the area of the INOmeter®.
	B. INOMAX cylinder valve is closed. (Delivery Stopped will occur one hour from the point when the cylinder valve is closed).	a. Open INOMAX cylinder valve.
	C. Transport Cap not connected to the INOmeter. (Delivery Stopped will occur one hour from the point when communication is lost).	a. Attach the Transport Cap to the INOmeter on the INOMAX cylinder. b. Connect the Transport Regulator/Cap Assembly cable to the infrared connector on the back of the INOmax DS_{IR}.
	D. INOMAX cylinder not present on the INOmax DS_{IR}. (Delivery Stopped will occur one hour from the point when communication is lost).	a. Load an INOMAX cylinder onto the INOmax DS_{IR} cart.
	E. INOmeter may have failed.	a. Replace the INOMAX cylinder on the INOmax DS_{IR} cart.
	F. INOmax DS_{IR} infrared cart cable is not connected or has failed.	a. Connect infrared cart cable to the infrared connector on the back of the INOmax DS_{IR}. b. Replace the INOmax DS_{IR}.

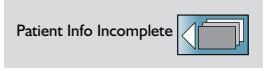
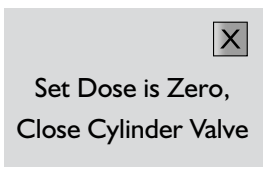
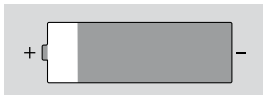
High Priority Alarms		
Symptom/Alarm	**Possible Cause**	**Recommended Action**
7. Delivery Failure 	A. Monitored NO levels ≥ 100 ppm or B. The INOmax DS_{IR} has failed.	a. If the INOblender is available, manually ventilate the patient (see INOblender Operation Manual). or b. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual). c. Power the INOmax DS_{IR} to STANDBY and then back ON to reset the delivery system. If this does not work contact Customer Service. d. Replace the delivery system if in use. e. Do not use the delivery system until serviced.
8. Delivery Stopped 	A. Infrared communication link between the INOMAX cylinder and the INOmax DS_{IR} has been lost for one hour.	a. Remove obstruction between the INOMAX cylinder and the INOmax DS_{IR}. b. Move the interfering light or the cart to reduce the high intensity light in the area of the INOmeter. c. If the INOblender is available, manually ventilate the patient (see INOblender Operation Manual). or d. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual).
	B. INOMAX cylinder is expired and cylinder valve has been open for two minutes.	a. Remove the INOMAX cylinder from the INOmax DS_{IR} cart. b. Connect an INOMAX cylinder to the INOmax DS_{IR} with a valid expiration date.
	C. INOMAX cylinder is the wrong concentration and cylinder valve has been open for two minutes.	a. Remove the INOMAX cylinder with the wrong concentration from the INOmax DS_{IR} cart. b. Connect an INOMAX cylinder to the INOmax DS_{IR} with a valid concentration.
	D. INOmeter may have failed.	a. Replace the INOMAX cylinder on the INOmax DS_{IR} cart.
	E. INOMAX cylinder valve is closed.	a. Open INOMAX cylinder valve. b. If the INOblender is available, manually ventilate the patient (see INOblender Operation Manual). or c. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual).
	F. INOMAX cylinder not present on the INOmax DS_{IR}.	a. Load an INOMAX cylinder onto the INOmax DS^{IR} cart. b. If the INOblender is available, manually ventilate the patient (see INOblender Operation Manual). or c. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual).

High Priority Alarms		
Symptom/Alarm	**Possible Cause**	**Recommended Action**
9. Drug Past Expiry Date or Drug Concentration Mismatch 	A. INOMAX cylinder is expired (Delivery Stopped will occur two minutes from the point when the cylinder valve is opened).	a. Close the cylinder valve. b. Remove expired INOMAX cylinder from the INOmax DS_{IR} cart. c. Replace the expired INOMAX cylinder on the INOmax DS_{IR} cart.
	B. INOMAX cylinder is the wrong concentration. (Delivery Stopped will occur two minutes from the point when the cylinder valve is opened).	a. Close the cylinder valve. b. Remove the INOMAX cylinder with the wrong concentration from the INOmax DS_{IR} cart. c. Replace the expired INOMAX cylinder with the wrong concentration on the INOmax DS_{IR} cart.
10. Injector Module Fail 	A. The Injector Module electrical cable may be disconnected.	a. Reconnect the Injector Module electrical cable. b. Turn OFF the INOmax DS_{IR} set dose to silence the alarm. c. If the INOblender is available, manually ventilate the patient (see INOblender Operation Manual). or d. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual).
	B. The Injector Module may have failed.	a. Turn OFF the INOmax DS_{IR} set dose to silence the alarm. b. If the INOblender is available, manually ventilate the patient (see INOblender Operation Manual). or c. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual) d. Replace the Injector Module. e. Set the delivered dose and turn OFF the INOblender or the backup mode.
	C. The Injector Module electrical cable may have failed.	a. Turn OFF the INOmax DS_{IR} set dose to silence the alarm. b. If the INOblender is available, manually ventilate the patient (see INOblender Operation Manual). or c. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual). d. Replace the Injector Module electrical cable. e. Reset the delivered dose and turn OFF the INOblender or the backup mode.

High Priority Alarms		
Symptom/Alarm	**Possible Cause**	**Recommended Action**
11. Low Battery Alarm 	A. Battery is running low (approximately 10 minutes or less until battery depletion).	a. Check main power indicator. b. Connect to AC main power source. c. Make sure the power cord is fully inserted into the Power Cord Inlet and that the power cord clamp is secure. d. Check and replace fuse if necessary. e. Contact Customer Service.
12. Low NO/N_2 Pressure 	A. The NO cylinder supply may be low.	a. Make sure the NO cylinder is turned ON. b. If the high pressure cylinder gauge reads less than 200 psig, change the cylinder. c. If the INOblender is available, manually ventilate the patient (see INOblender Operation Manual). or d. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual).
	B. The supply line may not be connected.	a. If the cylinder gauge reads greater than 200 psig. b. Verify the low pressure hoses are connected correctly to the back of the INOmax $DS_{IR.}$ c. If the INOblender is available, manually ventilate the patient (see INOblender Operation Manual). or d. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual).
13 . Service Required 	A. The INOmax DS_{IR} has failed.	a. If the INOblender is available, manually ventilate the patient (see INOblender Operation Manual). or b. Turn the backup mode ON (see page 29 of Operation and Maintenance Manual). c. Turn the INOmax DS_{IR} to STANDBY and then back ON to rest the delivery system. Please contact Customer Service and replace the delivery system as soon as possible.
14. Set NO and Backup On 	A. The backup mode has been turned ON and the set dose is still set.	a. Turn the INOmax DS_{IR} set dose to zero. b. Correct the reason for initiating the backup mode. c. Turn ON the INOmax DS_{IR} set dose. d. Turn the backup mode OFF. e. If this does not work contact Customer Service.

Low Priority Alarms		
Symptom/Alarm	**Possible Cause**	**Recommended Action**
15. Backup On 	A. The backup mode has been turned ON and the set dose is zero.	a. Correct the reason for initiating the backup mode. b. Turn ON the INOmax DS_{IR} set dose. c. Turn the backup mode OFF.
16. Failed NO Sensor 	A. The wrong calibration gas may have been used.	a. Make sure the correct calibration gas is used and ensure sample tubing connections are secure and do not leak.
	B. There is a leak around the sensors.	a. Make sure the sensors are correctly seated with the O-rings and the sensor cover is fully closed.
	C. NO sensor absent or failed.	a. Complete a low calibration first, and then repeat the high calibration. b. Sensor needs to be replaced. c. Replace the delivery system if in use. d. Contact Customer Service.
17. Failed NO_2 Sensor 	A. The wrong calibration gas may have been used.	a. Make sure the correct calibration gas is used and ensure sample tubing connections are secure and do not leak.
	B. There is a leak around the sensors.	a. Make sure the sensors are correctly seated with the O-rings and the sensor cover is fully closed.
	C. NO_2 sensor absent or failed.	a. Complete a low calibration first, and then repeat the high calibration. b. Sensor needs to be replaced. c. Replace the delivery system if in use. d. Contact Customer Service.
18. Failed NO_2 Sensor 	A. The wrong calibration gas may have been used.	a. Make sure the correct calibration gas is used and ensure sample tubing connections are secure and do not leak.
	B. There is a leak around the sensors.	a. Make sure the sensors are correctly seated and the sensor cover is fully closed.
	C. O_2 sensor absent or failed.	a. Complete a low calibration first, and then repeat the high calibration. b. Sensor needs to be replaced. c. Replace the delivery system if in use. d. Contact Customer Service.

Low Priority Alarms		
Symptom/Alarm	**Possible Cause**	**Recommended Action**
19. Monitoring Failure 	A. Monitor is failing to communicate correctly or is reporting a fault.	a. Does not stop delivery of INOMAX to the patient. b. Contact Customer Service.
20. Sample Line/Filter Block 	A. The sample line may be blocked.	a. Make sure the sample inlet line and outlet ports are not obstructed. b. Change the sample line.
	B. The water separator cartridge may be blocked.	a. Replace the water separator cartridge. 
21. Two Cylinders Open 	A. Two cylinder valves are open.	a. Close one of the cylinder valves.
22. Water Trap Bottle Full 	A. The water trap bottle on the side of the INOmax DS_{IR} is full.	a. Empty the water trap bottle.
	B. Water trap bottle is empty but the message remains in the alarm message box.	a. Remove the water trap bottle and clean the optical sensor level indicator with an alcohol swab.
	C. The INOmax DS_{IR} may have failed.	a. Contact Customer Service. b. Replace the delivery system if in use.

Indicators		
Symptom/Indicator	**Possible Cause**	**Recommended Action**
23. Patient Info Incomplete 	A. Patient identifier has not been entered.	a. Enter patient identifier.
24. Set Dose is Zero, Close Cylinder Valve 	A. The set dose has been set to zero and the INOMAX cylinder valve is still open.	a. Close the INOMAX cylinder valve if treatment has been stopped.
25. Running on Battery 	A. Device is operating on the battery.	a. Connect to AC main power source when available. b. Check main power indicator.  c. Make sure the power cord is fully inserted into the Power Cord Inlet and that the power cord clamp is secure.